

## **REMARKS**

The Office Action mailed June 3, 2005 has been carefully reviewed and considered.

In response, claims 121 and 127 have been amended along with dependent claim 127. Claims 121 and 127 having been amended, the claims now pending are claims 92-97, 101-115 and 119-135. A favorable review of the claims is respectfully requested.

The Examiners acknowledgment of the continued examination and the withdraw of the finality of the previous office action is noted with appreciation. In addition, the Examiners response to the arguments made in the previous correspondence from the Applicant is also noted with appreciation.

On page 6 of the Office Action, the Examiner has objected to claim 21 due to an informality. An amendment has been made to claim 21 to address the informality raised by the Examiner. In view of the amendment to claim 21, it is respectfully submitted that the rejection is now moot.

On page 6, Examiner has rejected claim 27 under 35 USC §112, second paragraph, as being indefinite, suggesting an amendment to the claim to address the rejection. The suggested amendment to claim 27 has been made. In view of the amendment to claim 27, it is respectfully requested that, in so far as the section 112 rejection may be maintained with respect to claim 127, reconsideration and allowance are respectfully requested.

With respect to claim 127, it is further noted that a further amendment to the

claim was made to correct a typographical error in order to speed the allowance of the present application.

On pages 6 and 7, the Examiner has rejected claims 92-97, 101-107 and 113-114 under 35 USC Section 103(a) as being unpatentable over Drzal (U.S. Patent No. 6,565,927 B1). In this regard, the Examiner asserts that Drzal et al. teach a method comprising the steps of:

- a. generating an active zone using an electro magnetic source;
- b. exposing the surface of said substrate of the active zone, whereby the surface of the substrate is chemically modified for adhering a material onto the substrate by exposure to the active zone, wherein the substrate is exposed to this electro magnetic radiation in the active zone including ultra violet radiation.

In response, it is respectfully submitted that Drzal et al. do not disclose a single step of exposing the surface of the substrate to the active zone for adhering material onto the substrate by exposure to the active zone, but instead disclose a two-step process in which, prior to exposing the substrate to UV radiation, water droplets, or a sheet of water are placed on or direct onto the substrate surface (see Column 6, lines 40-42). In fact, it is respectfully submitted that Drzal et al. teach against using a one-step process in which the surface is exposed solely to radiation when Drzal et al. state, "the present process creates surfaces which wet better than if they were exposed solely to UV radiation (180 nm-500 nm), creates similar substrate surfaces in a shorter time than achieved using only UV or Ozone and is cheaper than using only UV or Ozone."

Furthermore, it is respectfully submitted that the UV light (see Column 7, lines 19-25) from the lamp 24, or alternatively, from a pulsed xenon lamp (see Column 8, line

45) is disclosed only as pulsed UV light. As discussed previously, in the prior communication to the U.S. Patent and Trademark Office in response to the previous Office Communications in the prosecution of this application, especially as it regards the Cates et al. (U.S. Patent No. 5,512,123), the use of a pulsed or "flash" type radiation is not a continuous radiation of the type disclosed and claimed in the present application. For this reason, the previously discussed rejections are respectfully traversed.

Indeed, it is respectfully submitted that Drzal et al. have provided a two-step process in order to keep sample surfaces cool during modification and to avoid heating that may result in undesirable effects. In this regard, it is respectfully noted that the present inventors have found a way to use continuous UV radiation in a single step process without having the deleterious effects that Drzal et al. apparently fear and have apparently taken extra steps to avoid. For this reason, and especially because Drzal et al. do not disclose the use of continuous UV radiation, as recited in the present claims, it is respectfully submitted that Drzal et al. does not teach the present invention. Therefore, in view of the foregoing, the Applicant respectfully requests that the Section 103 rejection of the aforementioned claims be reconsidered and withdrawn.

On page 9 of the Office Action, the Examiner acknowledges that Drzal et al. do not teach exposure of the substrates to continuous ultra-violet radiation. In spite of this acknowledgment, the Examiner asserts that the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. In response, however, the Applicant respectfully submits that Drzal et al. had no appreciation for how they might use continuous UV radiation and still avoid all of the deleterious effects of overheating the surfaces involved that they so feared. It is

respectfully submitted that Drzal et al. so feared such bad results, that they carefully avoided such effects by their two-step process, in which water is first administered to the surface before or as the UV radiation is applied. Furthermore, Drzal et al. indicate that they have a concern regarding deleterious effects of UV radiation in higher ranges than were used, that are known to be emitted with UV radiation in the medium range selected by Drzal et al. Applicant respectfully submits that such concerns would be even harder to manage if Drzal et al. were using continuous UV light. This concern further bears out the teaching of Drzal et al. to be very careful to avoid any UV radiation that may overheat the surfaces and cause deleterious effects. Therefore, it is respectfully submitted that it would not have been obvious to use continuous radiation after a reading of Drzal et al. by one of skill in the art, because Drzal et al. go to such lengths to be careful about overheating surfaces, which is the major concern of using continuous radiation and because Drzal et al. does not address what efforts must be taken when using continuous radiation instead of the "pulsed" radiation that Drzal et al. teach. Therefore, it is respectfully submitted that, not only do Drzal et al. not teach the use of continuous radiation, as noted by the Examiner, but they in fact teach away from such a risk filled use of UV light on the sensitive surfaces they treat. In view of the foregoing, it is respectfully requested that the rejection of the aforementioned claims be reconsidered and withdrawn. The Applicant's appreciation for the Examiner's consideration in this regard is noted.

On page 11 of the Office Action, claims 108-112 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Drzal et al. as applied to the aforementioned claims, and in further view of Cates et al. (U.S. Patent No. 5,512,123) and Elliott et al.

(U.S. Patent No. 5,669,979). These rejections are respectfully traversed. In this regard, it is noted that the aforementioned claims, claims 108-112, are dependent claims. In view of the foregoing arguments, it is respectfully submitted that the underlying independent claim is believed to be patentably distinct from the teaching cited by the Examiner and the Applicant has requested that the rejections of the independent claims be reconsidered withdrawn. In view of the foregoing, in so far as the rejection of the independent claim is withdrawn, the Examiner is respectfully requested to withdraw the Section 103 rejections of the dependent claims. Furthermore, as noted above, Cates teaches pulsed UV radiation and it respectfully submitted that Elliott et al. do as well. Therefore, without the teaching of the continuous use of the UV radiation, it is respectfully submitted that the case of obviousness cannot be maintained. Reconsideration and withdraw are respectfully requested.

On page 13, claims 115 and 120 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Drzal et al. These rejections are respectfully traversed. In this regard, the Examiner notes that Drzal et al. is applied for the reasons incorporated in the prior assertions. The Examiner notes that Drzal does not teach the intensity of the electromagnetic radiation at the surface of the substrate and asserts that the intensity of the electromagnetic radiation is a result-effective variable and that one skilled in the art has the skill to calculate the intensity that would determine the success of the desired reaction to occur, absent evidence to the contrary. In this regard, it is respectfully submitted that Drzal et al. has gone to lengths to find only a few ways of limiting damage to the surface and have not taught the continuous use of UV radiation. In this regard, it is respectfully submitted that it is not at all likely that one skilled in the art

would be able to find such an appropriate range after removing the first step employed by Drzal et al., the step of adding water to the surface of the substrate prior to or during the exposure of the surface to the pulsed UV radiation. In view of the foregoing, reconsideration and withdraw of the aforementioned rejections are requested.

On pages 14 and 15, separate Section 103 rejections are asserted with respect to claims 121-123; claims 124-127; claims 128-132 and 134-135; and claim 133 for reasons that incorporate the previous rejections asserted by the Examiner. These rejections are respectfully traversed. In each of these respective cases, the arguments asserted above are respectfully submitted in this regard. As noted above, it is respectfully submitted that Drzal et al. does not teach continuous UV radiation and that Drzal et al., when combined with Cates et al. and/or Elliott et al., do not disclose continuous exposure to UV radiation and in fact teach against such use as do Cates et al. and Elliott et al., as noted in prior communications to the Examiner.

The Examiner's consideration in this regard is respectfully requested and reconsideration and withdraw of the aforementioned rejections is respectfully requested.

The Examiner's acknowledgment of the respective Supplemental Information Disclosure Statements is noted with appreciation.

The present response is accompanied by a further Supplemental Information Disclosure Statement disclosing references that were recently made available to the Applicant and were cited in the European Search Report for a related application. The disclosure of the German patent and the Japanese patent are not available in English to the Applicant and the Applicant's Attorney, but are disclosed nevertheless. The Fast, geb. Falier, Maria (German Patent No. DE3631123) discloses a procedure in which

parts are aggressively cleaned with heated solvents, then irradiated with UV radiation for 15 to 30 minutes to achieve desired results for better adhesion to shoe parts. There is a mention of the range of 200nm to 400nm for the radiation, but the dosage level does not appear to be mentioned. It is apparent that the dosage level must be very low because of the length of time it takes to treat the samples. Also, they treat the parts in a confined chamber, essentially treating these parts with a chemical to precondition them for subsequent irradiation and in extended time and in a single chamber. They don't mention the type of lamp or if he uses any other lamps; he just says UV exposure.

The Ushio Inc. (Japanese Patent No. JP 2000 041701) discloses using a high powered flash lamp that flashes ten times and then rests for 3 minutes. In addition to being extremely inefficient, exposure to such radiation will cause extensive overheating and will require long processing time. The spectrum these flash lamps have a very broad spectrum from the UV wave into the Infra Red which begins above 750 to 800 nm. In addition, the disclosed process requires extensive pre-cleaning and multiple exposures in order to get a bondable surface as declared in the example. The process is carried out in a chamber with no mention of automation such as a conveyor system, etc.

The Zelez et al. (U.S. Patent No. 6,098,618) reference discloses a process for treating plastic substrates including exposing the substrate to UV radiation. This Invention is basically a cleaning patent. The inventor here uses Oxygen in a chamber and exposes parts for 5 to 60 minutes to clean the surface for bonding. This is not a surface modification process as we have disclosed.

PCT Publication No. WO 01/22844 A1 discloses a process for treatment of shoe

soles using ultra violet radiation combined with ozone. Here the author irradiates shoe parts with UV in a chamber which is filled with ozone. He goes into great length on how his chamber is filled with Ozone and maintained a certain ozone flow, a must in his process. Again, the process required two processes in order to be effective. The parts are irradiated at 130 nm to 185 nm. The cost of trying to achieve radiation in the 130 to 185 is very high and is probably completely impractical because glass, even the highest quality quartz cuts off about 180nm. In order to achieve irradiance in this region the parts would have to be in a vacuum.

PCT Publication No. WO 00/01528 to Reimer discloses methods for plasma modifications of substrates such as footwear. In this publication, the author describes in detail how to treat shoe parts using a plasma chamber. Using plasma chambers is very time consuming and not practical from a number of aspects including cost of equipment, processing time, inability to automate without extremely expensive upgrades and must be confined within the vacuum chamber during processing and in many cases parts can not be plasma treated due to continuous outgassing in the vacuum chamber.

Caldari (WO98/05704) discloses pretreatment of surfaces with chemicals prior to UV treatment. This author prepares parts for bonding by first coating them with Chlorinated organic compounds using an organic solvent as a carrier. After the substrate has been coated with the polymer, it is then irrigated with UV photografting the polymers and their moieties onto the surface, thereby creating a bondable surface. This is a multistep process, which includes the use of chemicals and precoating of the substrate prior to UV exposure.



PCT Publication No. WO 98/05704 discloses a method for bonding polymeric materials by surface treating the materials with ultra violet radiation.

It is respectfully submitted that the present claims are patentably distinct over these further references, whether taken alone or in combination with any of the references now cited in the present application. Consideration of these further references is respectfully requested.

It is noted that a Petition for a three-month Extension of Time is provided herewith along with a check for the appropriate fee. In view of the Petition for Extension of Time, it is respectfully submitted that the deadline for responding to the present application is timely met by filing the Response on Monday, December 5, 2005, as the Office Action was mailed June 3, 2005 and the Office Action was due with a three month Extension of Time, such as the one provided, on December 3, 2005, a Saturday when the USPTO was closed. Insofar as Monday, December 5, 2005 was the first day when the USPTO was opened following the statutory deadline for response to the Office Action, it is respectfully submitted that the present response is timely submitted.

The Examiner is respectfully urged to contact the undersigned attorney if there are any further matters standing in the way of allowance of the above-identified application and it is believed by the Examiner that these matters can be addressed and resolved in a telephone conference and thereby speed the conclusion of the present prosecution. The Examiner's consideration in this regard will be appreciated.

Respectfully submitted,

For the Applicant,  
By his Attorneys

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